



Riverfront Office Center
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Bridge Aesthetics Workshop

Ten Determinants of Appearance

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The Ten Determinants of Appearance

1. Horizontal and Vertical Geometry
2. Superstructure Type
3. Pier / Support Placement / Span Arrangement
4. Abutment Placement and Height
5. Superstructure Shape
6. Pier Shape
7. Abutment Shape
8. Color
9. Texture, Ornamentation and Details
10. Lighting, Signing and Landscaping

#1 Horizontal and Vertical Geometry

- Bridge geometry is often very complex.
- Few bridges
 - Are located on straight alignments
 - Have flat horizontal deck surfaces
 - Have supports oriented at right angles to the superstructure
 - Have constant cross section widths
 - Are located on a flat site



#1 Horizontal and Vertical Geometry

- Bridges exist in a three dimensional world
- The observer's moving vantage point influences perception



Elevation view of pier



Representative view of pier experienced by most observers

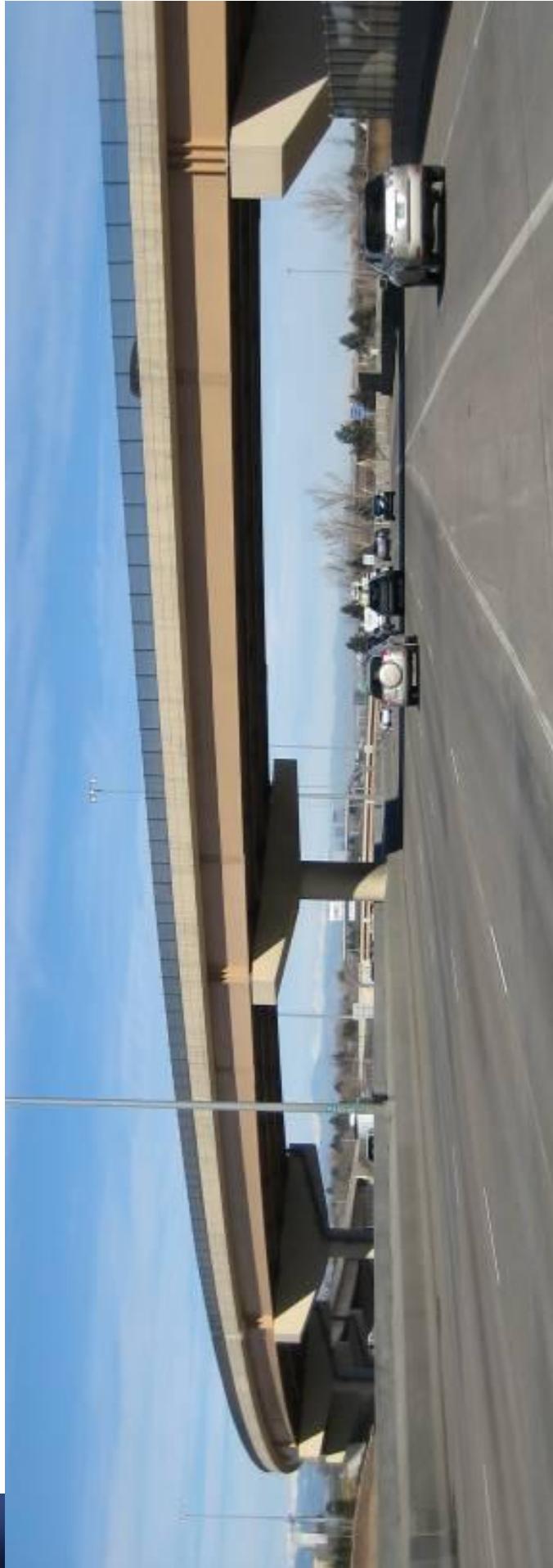
#1 Horizontal and Vertical Geometry

- Multiple variations in structure geometry may result in visually unappealing bridges



#1 Horizontal and Vertical Geometry

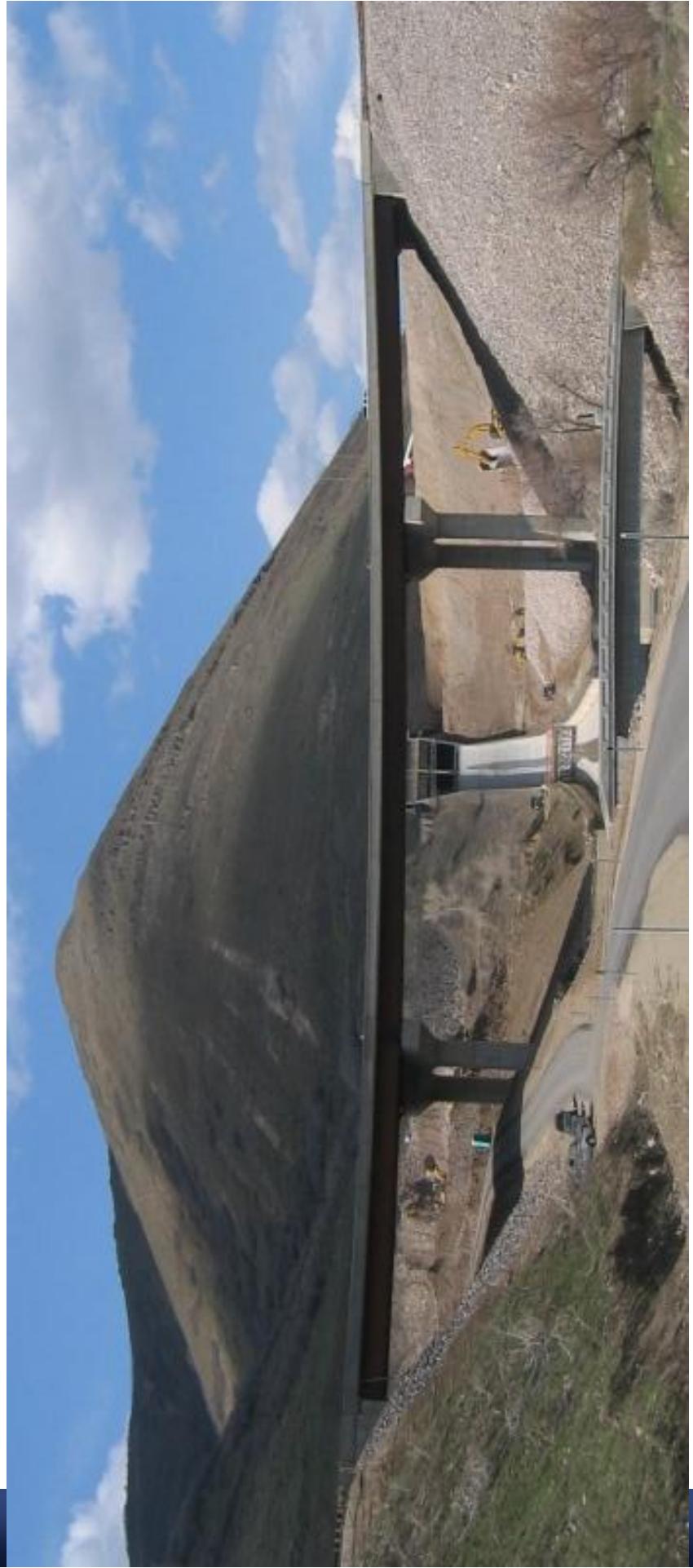
- Collaborate with design team members to achieve the best possible geometry that accommodates both functional and aesthetic objectives



Atypical pier cap is visually discordant

#1 Horizontal and Vertical Geometry

- Bridges on higher profile grades frame the landscape beyond
- Visual expression of a bridge as a connector



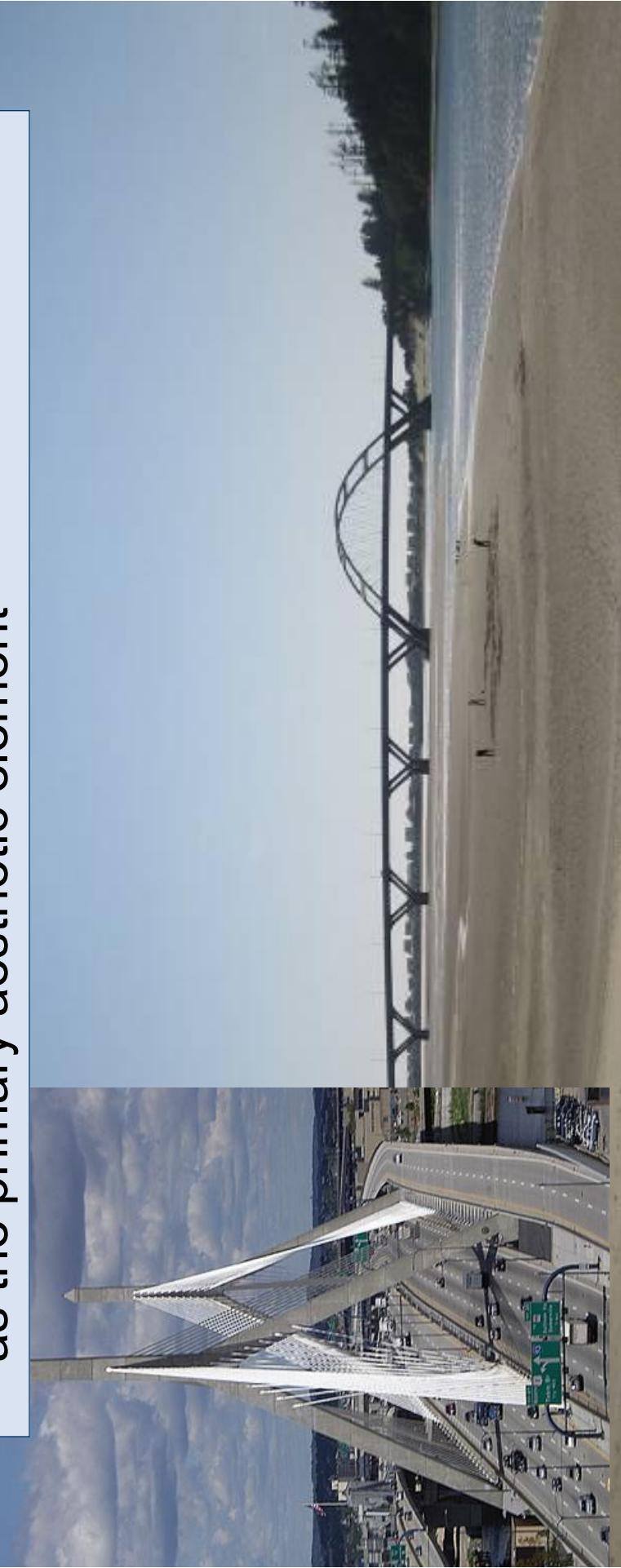
#1 Horizontal and Vertical Geometry

- Bridges close to the ground appear massive and opaque



#2 Superstructure Type

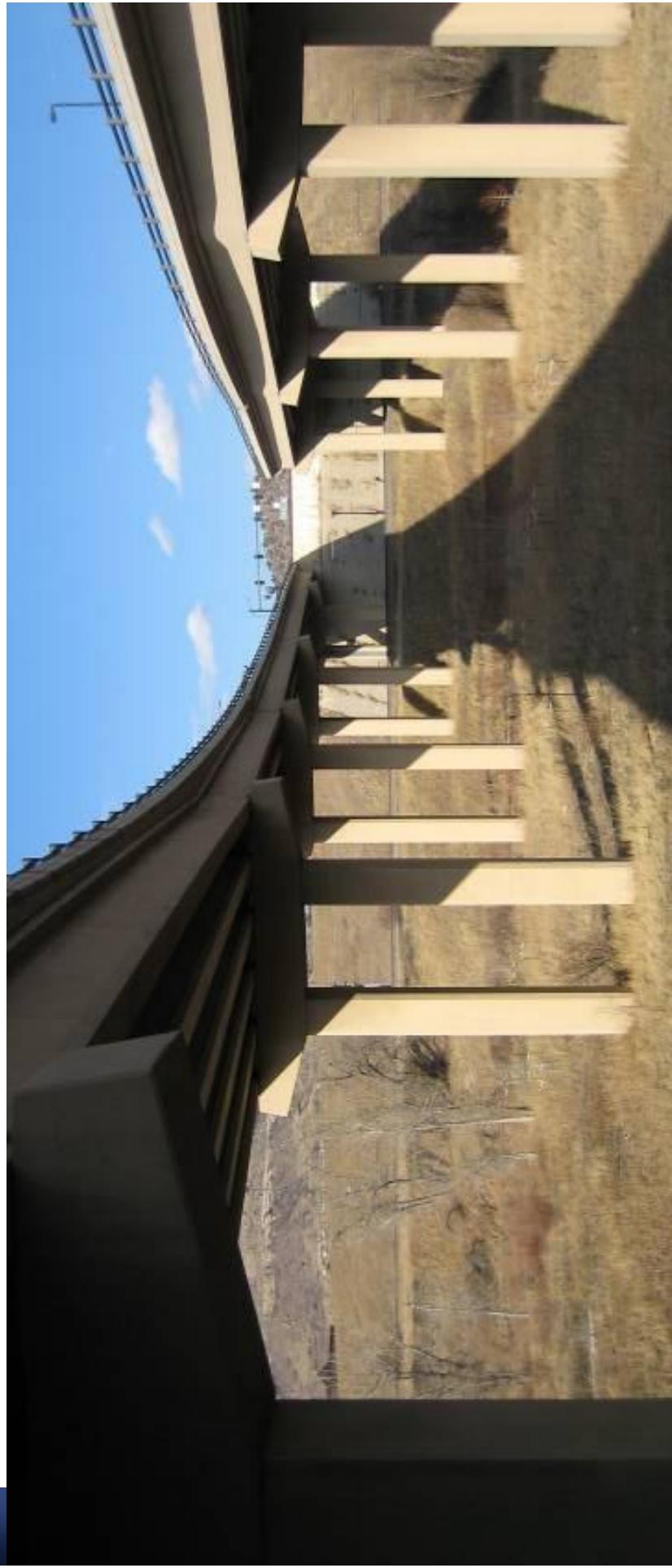
- The superstructure type creates the most memorable perception of a bridge.
- “Signature” bridges often rely on superstructure form as the primary aesthetic element



http://www.fadingad.com/blog/boston/charleston_bridge.jpg

#2 Superstructure Type

- The majority of workhorse bridges are constant depth girder type structures assembled from standardized structural components



#2 Superstructure Type

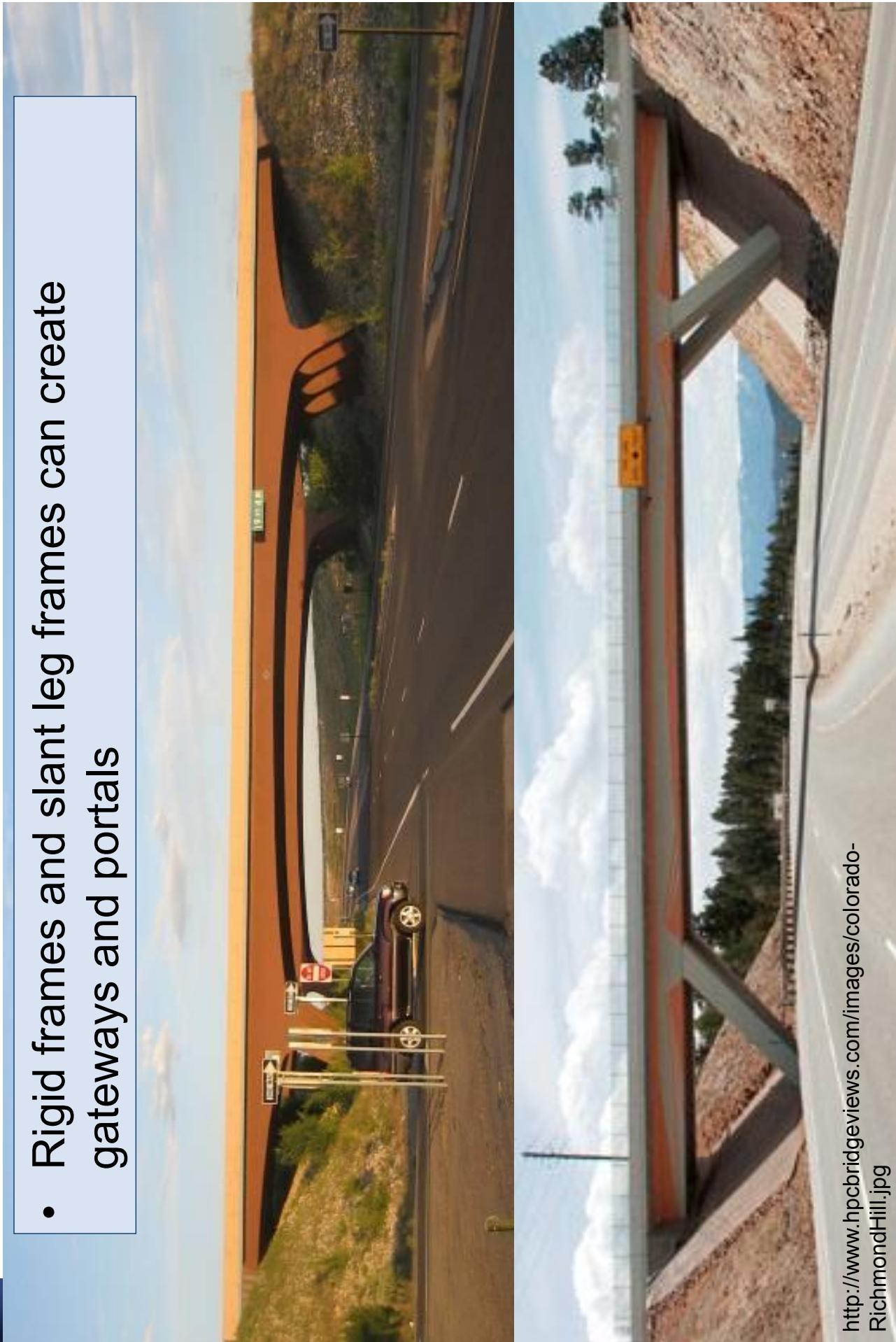
- Variable depth superstructures appear arched and provide visual interest



Combination of variable depth superstructure and massive abutments creates a community portal

#2 Superstructure Type

- Rigid frames and slant leg frames can create gateways and portals



#2 Superstructure Type

- Combining multiple superstructure types can result in visual discord and a lack of integrity



Combination of cast in place concrete, steel and precast concrete superstructures on one elevated interchange

#3 Pier and Span Arrangement

- Structure depths are proportional to spans
- Shorter spans have thinner superstructures with the visual emphasis on the substructure



Shallow structure depth relative to height above grade results in slender superstructure appearance

#3 Pier and Span Arrangement

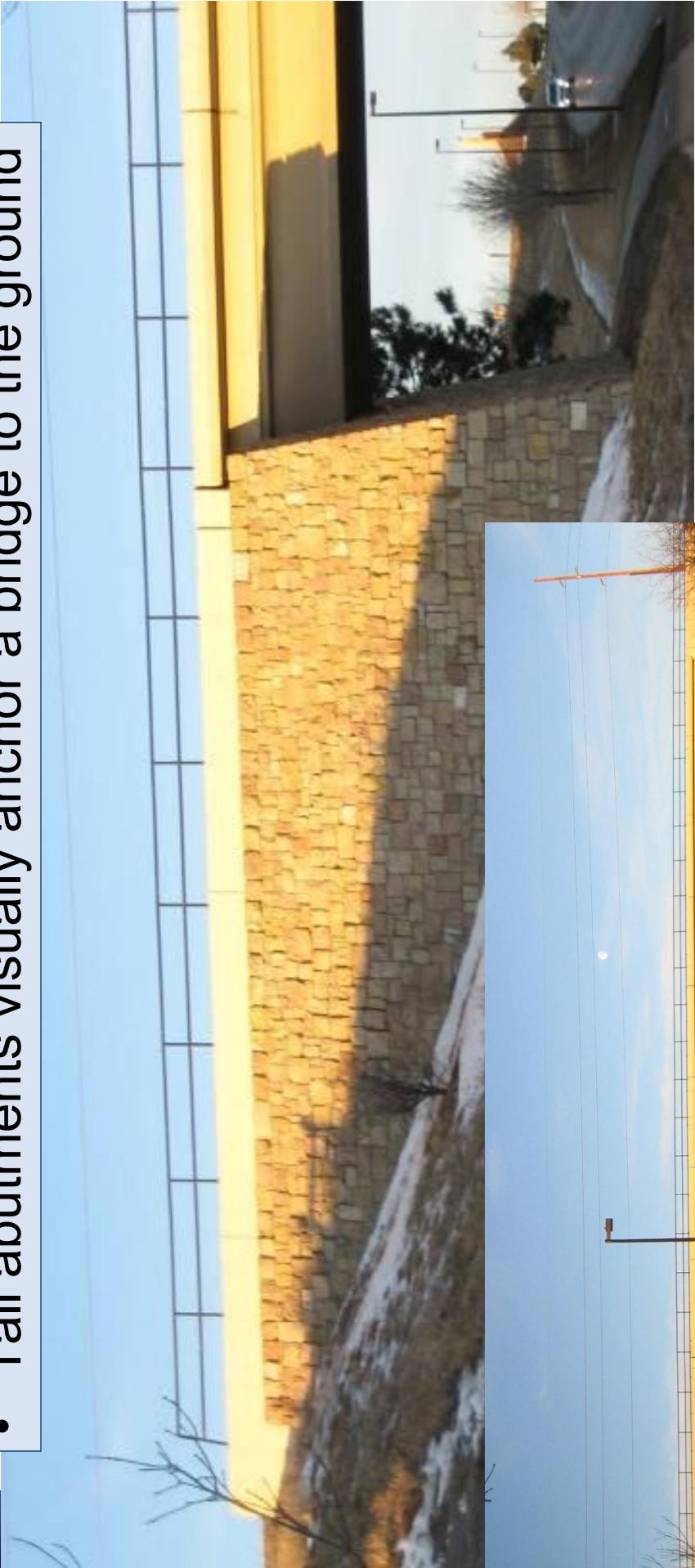
- Longer girder spans have deeper superstructures, which become dominant visual features



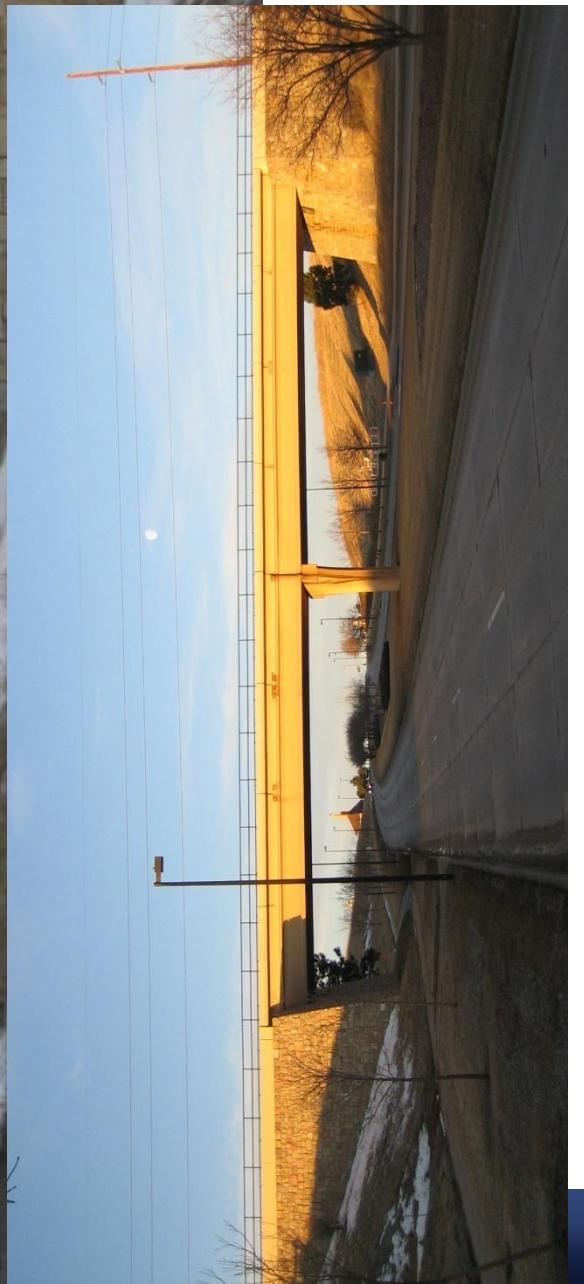
Deep structure relative to height above grade results in a massive superstructure appearance

#4 Abutment Placement and Height

- Tall abutments visually anchor a bridge to the ground



Bridge serving as a gateway into residential development



#4 Abutment Placement and Height

- Mid-height abutments also provide a visual termination while providing more visual transparency
- Trade-off of longer spans versus shorter abutments.



Abutment location distant from shoulder reduces visual mass of abutment and increases visual transparency.

#4 Abutment Placement and Height

- Short abutments are typically less expensive to construct relative to tall and mid height abutments. Visually, they can result in dark areas beneath the bridges.



Short abutments often result in a sliver of light in an otherwise dark space beneath the superstructure

#5 Superstructure Shape

- The superstructure fascia is a major visual feature
- Layering of structure and ornamentation resulted in visual interest



Complex fascia forms
and ornamentation

#5 Superstructure Shape

- Contemporary bridges are often constant depth superstructures with little ornamentation
- Reliance on deck overhangs and barrier fascia to create visual interest



Longer overhangs create shadows which reinforce the layering of surfaces and uninterrupted superstructure fascade

#5 Superstructure Shape

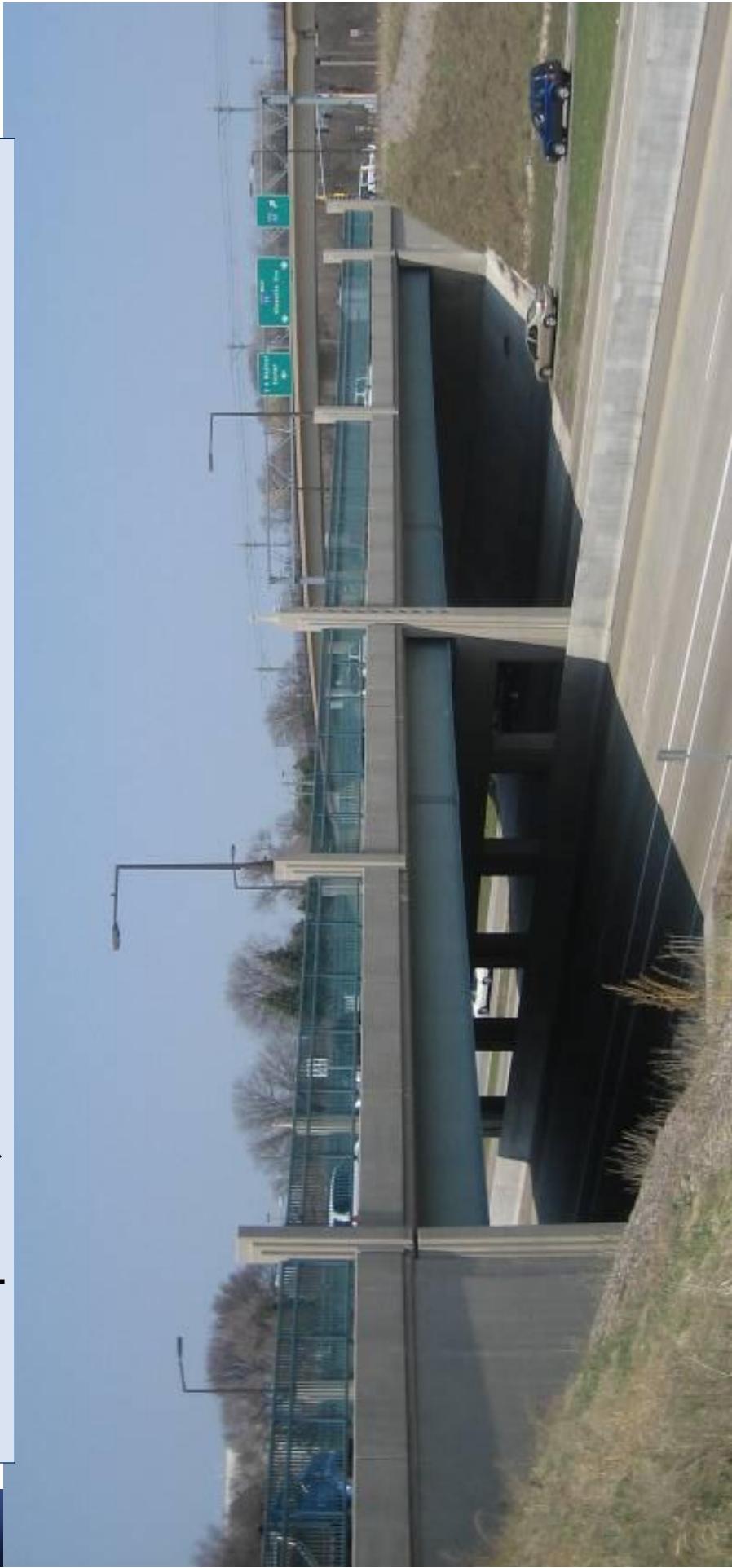
- Flat fascia surfaces result in a massive appearance



<http://en.structurae.de/structures/data/index.cfm?ID=s0019633>

#5 Superstructure Shape

- Projected substructure elements, such as columns and posts, can add visual interest



Columns projecting from fascia visually interrupt spans. Art deco detailing also provides visual interest

#5 Superstructure Shape

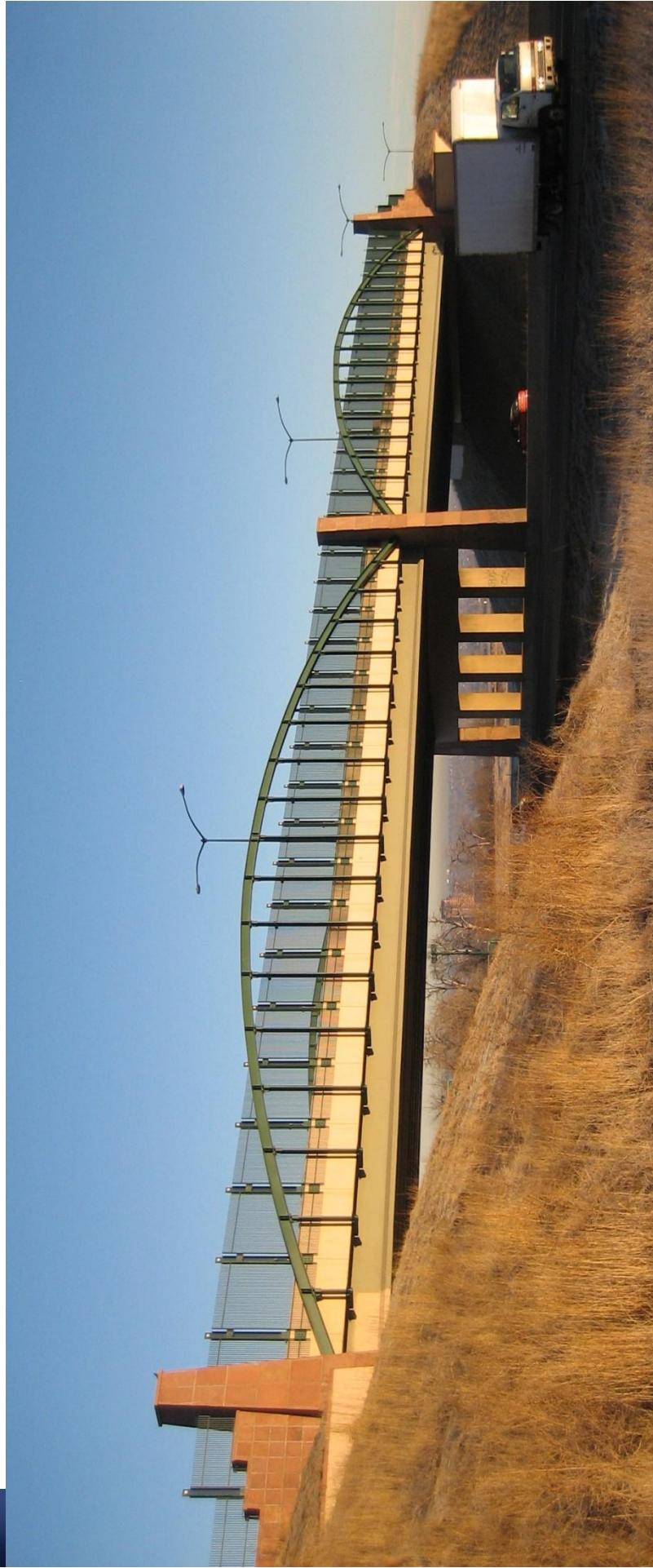
- Surface articulations on fascia girders provide visual interest while not obfuscating structure



Gateway viaduct combines modified precast concrete fascia girder with streetscaping elements.

#5 Superstructure Shape

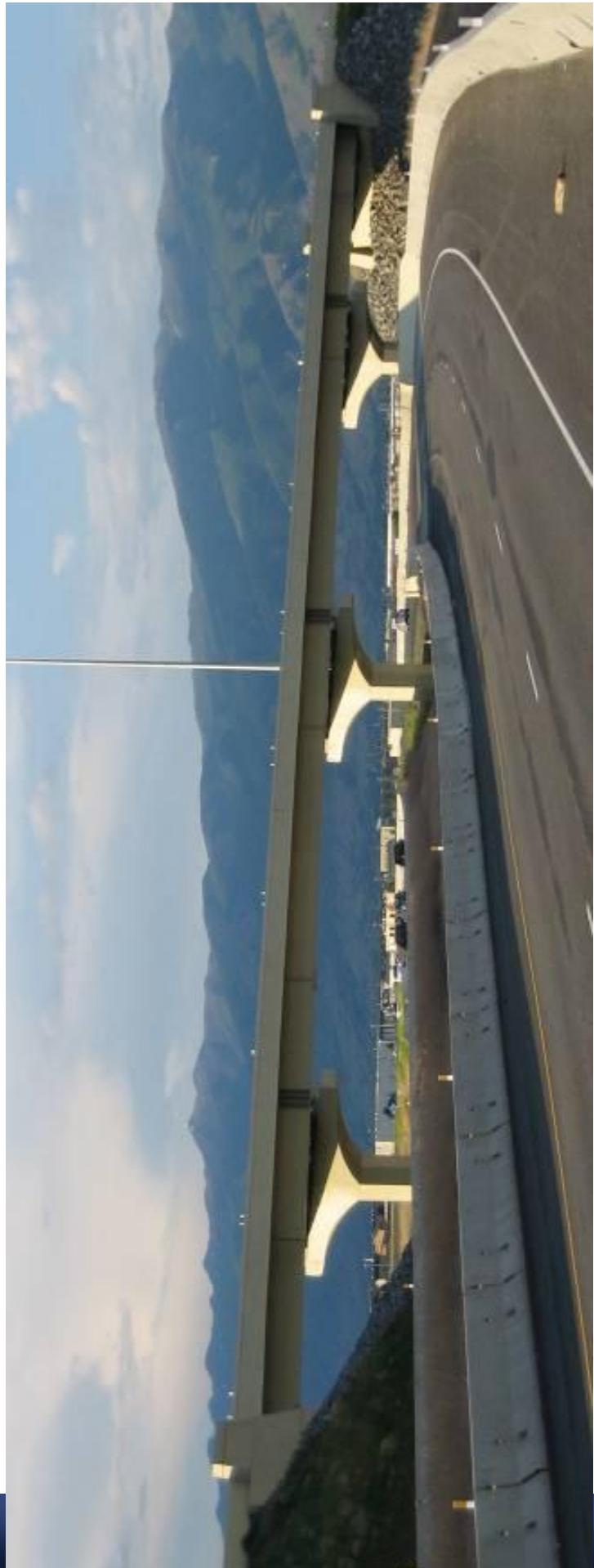
- Avoid applying structural forms as ornament. Don't camouflage the basic structure



Decorative arches applied to conventional highway overpass bridge. These arches obviously do not support the span

#6 Pier Shape

- Single column hammerhead piers provide for visual transparency on narrow bridges



Post tensioned pier caps result in reduced cap dimensions and slender appearance

#6 Pier Shape

- “Framed” piers with multiple columns and a drop pier cap are the most common pier type



#6 Pier Shape

- Proportions are a common problem with framed piers



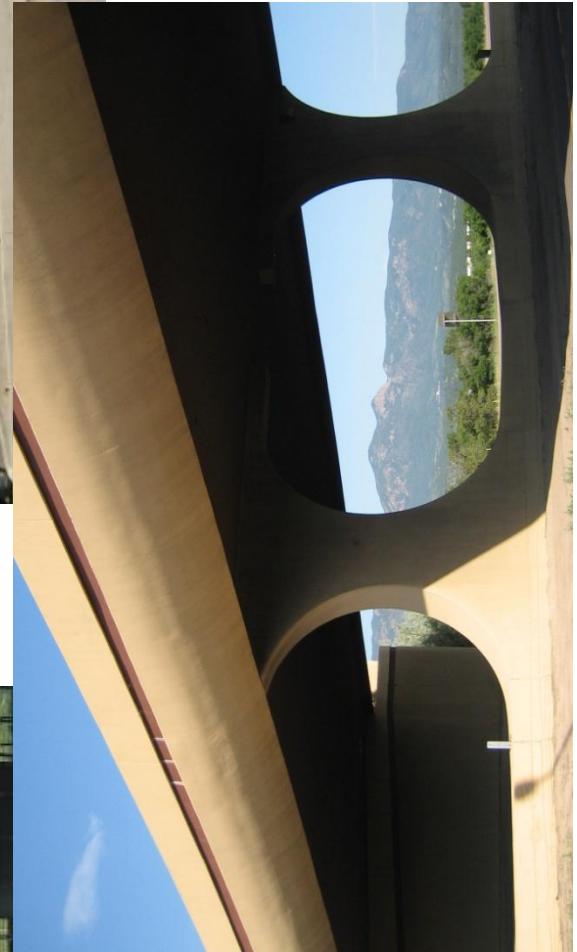
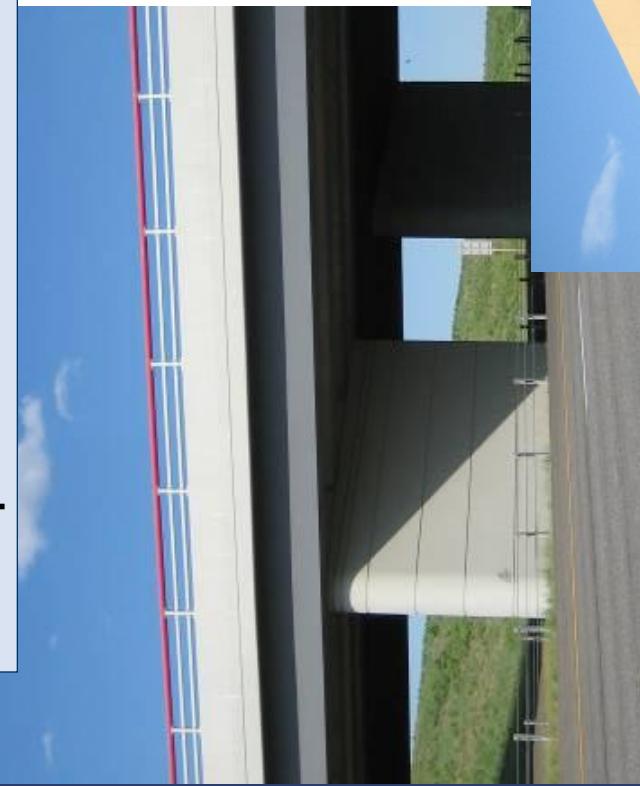
#6 Pier Shape

- Sculpted caps and columns provide visual interest



#6 Pier Shape

- Wall type piers offer a wide range of visual expression



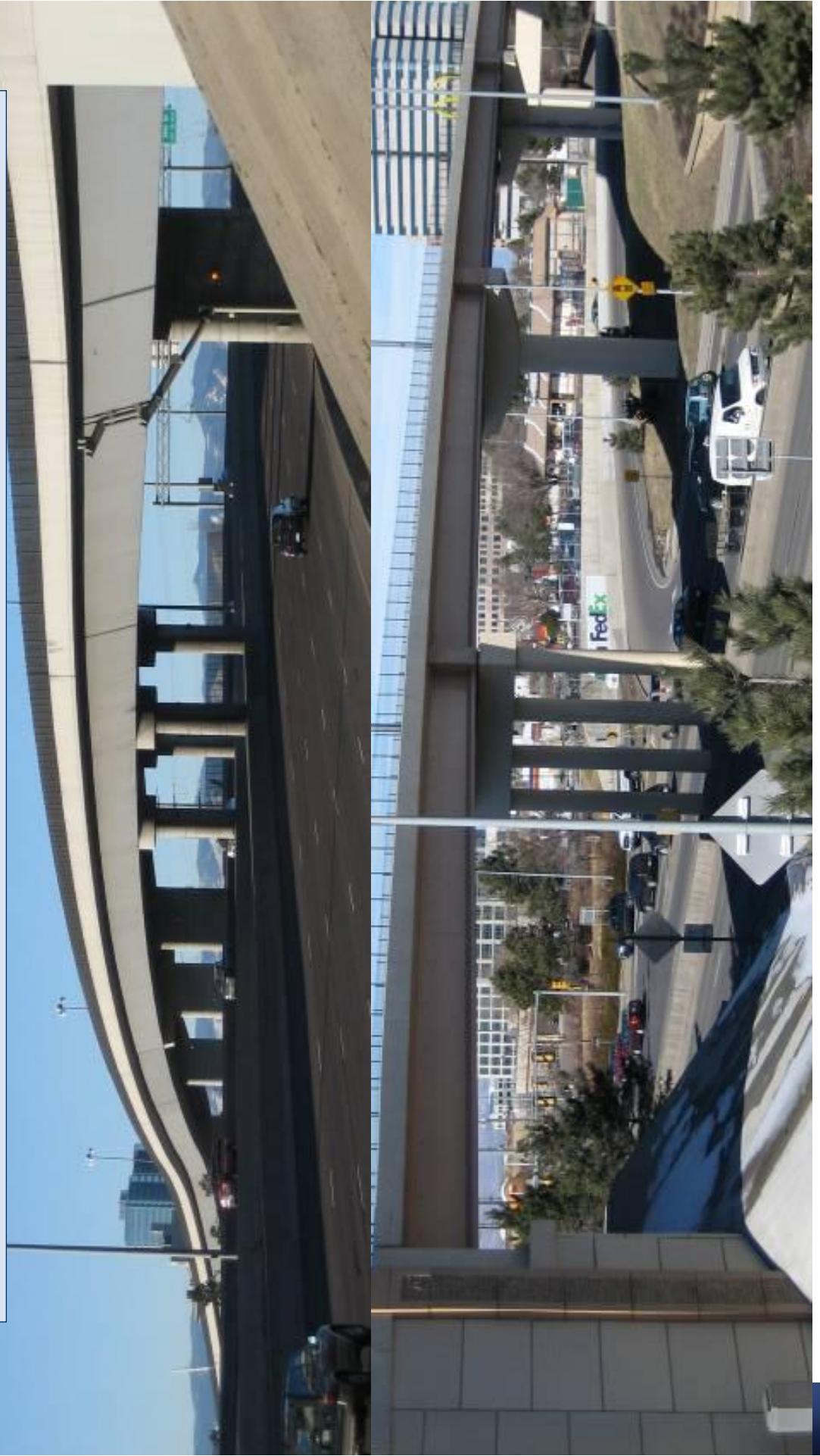
#6 Pier Shape

- Integral pier caps visually reinforce superstructure continuity and minimize substructure mass



#6 Pier Shape

- Combining pier types and shapes results in visual discord



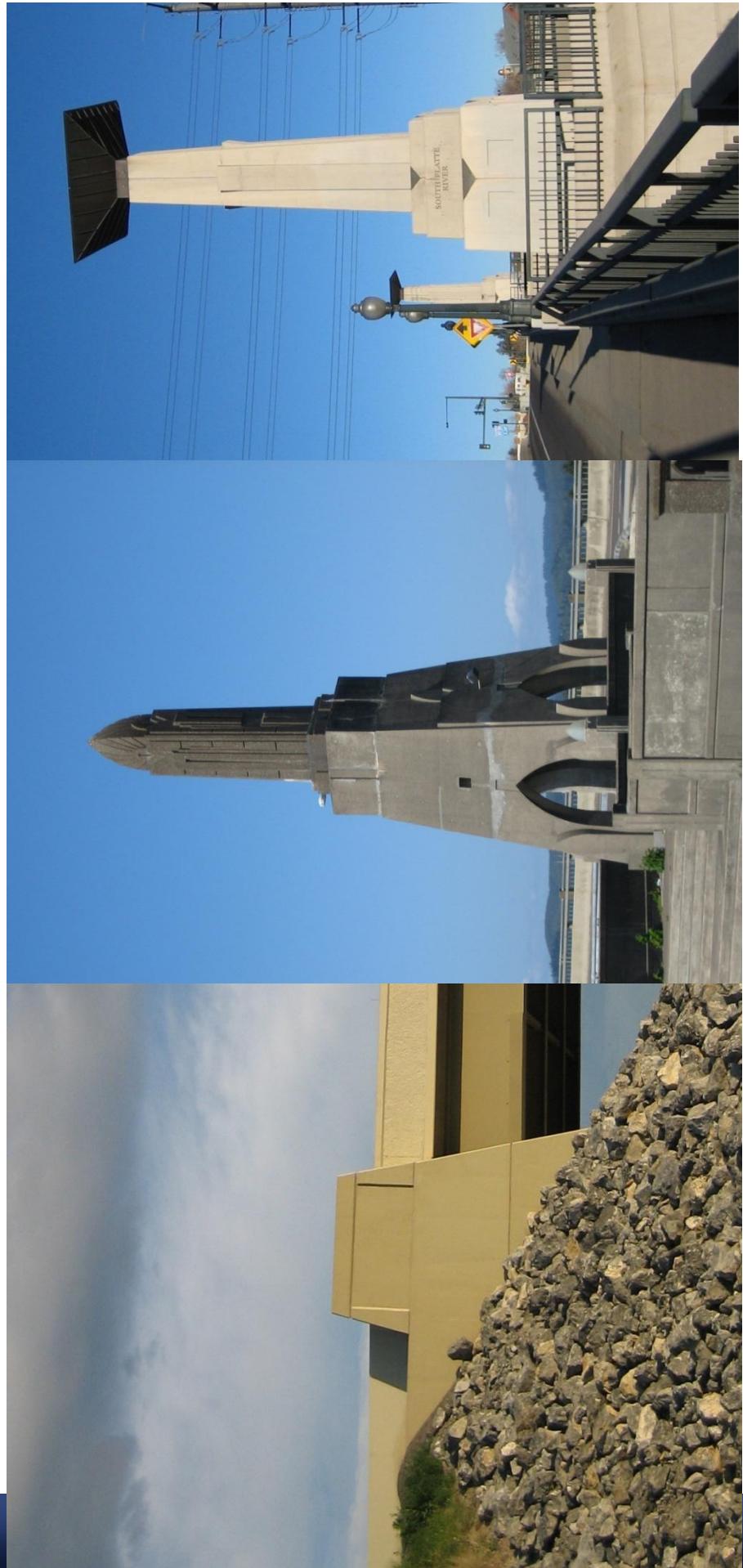
#7 Abutment Shape

- Short abutments combined with terracing and landscaping visually soften the connection between a bridge and its site



#7 Abutment Shape

- Pilasters or monuments visually define the ends of bridges or announce entry /exit



#7 Abutment Shape

- Tall abutment with wrap around wing walls create a strong visual anchor and portal effect
- Wing wall articulations create visual interest

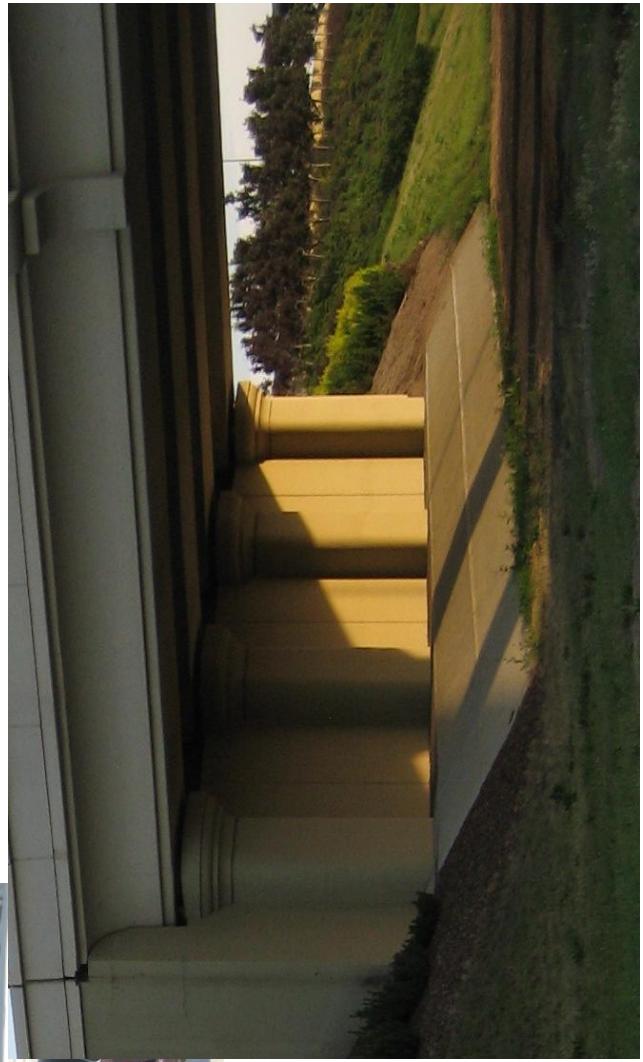


#7 Abutment Shape

- Front faces of abutment walls may provide opportunities



Urban bridge with pedestrian traffic beneath. Articulated long abutment surface and ceramic tile on abutment face provide visual interest



Gateway bridge incorporates pilasters into abutment face. Strong shadows break up wide abutment surface

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